Space Weather Forecast

Issued on Wednesday 8 January 2025 at 00:45 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate class flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with one long-duration Moderate-class flare observed peaking at 07/2305 UTC, likely from a sunspot region from just over the southwest limb. There are nine regions currently visible on the Earth-facing disc, with only one notable region approaching the north-centre disc. This has simplified a little compared to its recently very active phase, but remains moderately sized with some mixed magnetic polarity spots through its intermediate region. The other regions across the disc are all much smaller and simpler, and either stable or showing signs of decay.

No Earth-directed coronal mass ejection (CMEs) were observed.

Solar Wind / Geomagnetic Activity: Solar wind speeds were initially elevated at 500-550km/s and eased to near 470km/s by the end of the period, but with a period of 550-600km/s 07/0430-1250 UTC due to the passage of a glancing CME. Interplanetary Magnetic Field was Weak, but very briefly reached Moderate after the CME arrival peaking. The north-south component was weak and variable, but slightly favoured a southward direction after from 07/1250 UTC. Geomagnetic activity was Quiet to Unsettled (Kp 2-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was near background, and well below the level of a minor Solar Radiation Storm (S1).

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate is expected with an ongoing chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CME's. Current fast solar winds are expected to continue erratically easing through day 1-2 (08-09 Jan) to near background or slightly elevated levels, before a further brief enhancement is likely from the fast winds from another much smaller and likely weaker coronal hole, on days 3-4 (10-11 Jan). Geomagnetic activity is expected to be mostly Quiet with isolated Unsettled intervals. There is a chance of this increasing to Unsettled to Active with a slight chance of G1/Minor Storm intervals with the fast wind onset.

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to remain at or near background, with only a slight chance of rising in response to any notable flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	No	1	1	5	5
Strong	**G3**	No	1	1	1	1
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**R1-R2 (M Class)**	Yes	60	60	60	60
Very Active	**R3-R5 (X Class)**	No	10	10	10	10

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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